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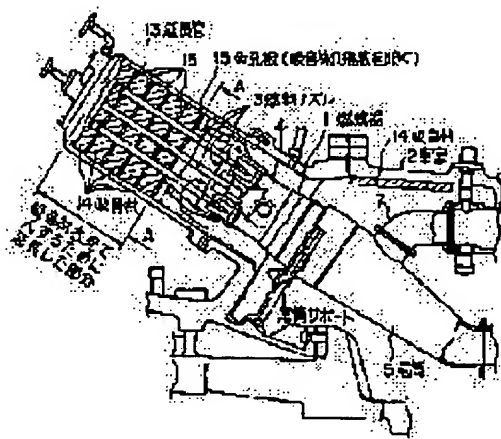
(54) COMBUSTOR

(57)Abstract:

PROBLEM TO BE SOLVED: To effectively absorb combustion vibration energy with sound absorbing material so as to prevent vibration accompanying combustion from generating by surrounding the upper stream side of fuel nozzles with a pipe, and filling the space between the pipe and the fuel nozzles with sound absorbing material.

SOLUTION: An extended pipe 13 is extended on the upper stream side of fuel nozzles 3 so as to surround the circumference of them. A sound absorbing material holder with perforated plates 15 is provided between the extended pipe 13 and the fuel nozzles 3, and the interior of the sound absorbing material holder is filled with sound absorbing material 14. The perforated plates 15 are provided for preventing the sound absorbing material 14 from splashing, the sound absorbing material holder is divided into several layers for freely setting deviation of the sound absorbing material 14 and the thickness of the sound

absorbing material 14 so as to enable damping effect to be adjusted. Because a space to be filled with the sound absorbing material 14 is provided on the upper stream parts of the fuel nozzles 3, the flow of air for combustion is not obstructed. The sound absorbing material 14 with the perforated plate 15 is also fitted on the inside of a cabin 2. Hereby, combustion vibration energy is effectively absorbed by the sound absorbing material to prevent vibration accompanying combustion from generating.



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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to the combustor which burns fuel by the gas turbine, the boiler, etc.

[0002]

[Description of the Prior Art] Drawing 6 is a cross section near [in the gas turbine equipped with the conventional combustor] a combustor, and explains the conventional combustor by this. In drawing 6 , 1 is a combustor and is attached in the vehicle room 2 of a gas turbine.

[0003] The combustor 1 has the fuel nozzle 3, the container liner 4, and the tail pipe 5. 6 is an outer case. The bypass elbow 7 is attached in the tail pipe 5. 8 shows the bypass valve and 9 shows the bypass valve adjustable mechanism.

[0004] 10 is an air compressor, and the compressor regurgitation air 11 compressed here flows in the vehicle room 2, and as an arrow shows through the surroundings of a combustor 1, it is introduced as a combustion air into a combustor 1 from the upstream of a fuel nozzle 3.

[0005] With a combustor 1, the combustor 1 shown in drawing 6 has the above composition, and the fuel fed through a fuel nozzle 3 burns, and the combustion gas is sent to a gas turbine 12, and drives this.

[0006] Although combustion vibration may occur within the above combustors 1, when combustion vibration occurs within a combustor in prime movers, such as a gas turbine, it is reflected inside a container liner, a tail pipe, and an outer case, the combustion vibrational energy turns into big vibrational energy, and we are anxious about breakage

of periphery articles, such as fatigue of the main part of a combustor, and also a turbine blade.

[0007] When big pressure fluctuation is produced within combustors, such as the container liner 4 in the combustor shown in drawing 6 , and a tail pipe 5, it has corresponded further conventionally change of operation parameters, such as a rate of a partition ratio of fuel, air distribution in a combustor, and a load down, and by converting the structure of a combustor itself.

[0008]

[Problem(s) to be Solved by the Invention] Although change of an operation parameter or reconstruction of the structure of the combustor itself is needed with the conventional combustor when big pressure fluctuation is produced as described above, change of the operating range and reconstruction of structure are difficult.

[0009] Therefore, this invention makes it the technical problem to offer the combustor constituted possible [suppression of that the vibration accompanying combustion occurs without not needing change of an operation parameter, but change of structure being also necessary minimum and needing large reconstruction].

[0010]

[Means for Solving the Problem] In order that this invention may solve the aforementioned technical problem in the combustor equipped with the fuel nozzle, it surrounds the upstream of a fuel nozzle with a pipe, and offers the combustor which filled up the space between the pipe and fuel nozzle with acoustic material.

[0011] In order to solve the aforementioned technical problem, this invention adopts the composition which arranged acoustic material as the inside of the structure which surrounds the surroundings of a combustor and forms combustion-air passage again.

[0012] In the combustor of this invention, the inside of the combustion-air passage of the surroundings of a fuel nozzle or **** of a combustor is made to decrease combustion

vibrational energy with an easy means to arrange acoustic material, and the stable zone of combustion is expanded to it.

[0013] As an acoustic material adopted with the combustor by this invention, by considering as much more acoustic material, few ** held with the perforated plate can also prevent scattering of acoustic material with the perforated plate, and is desirable.

[0014] For example, by manufacturing an acoustic-material electrode holder with a perforated plate, and putting the electrode holder on many layers by being filled up with acoustic material in the electrode holder, a damping effect can be adjusted and the bias of acoustic material and scattering can be prevented.

[0015] Thus, the change of structure to the conventional combustor can also be finished to necessary minimum, and it is not necessary to also change an operation parameter, and, according to this invention, an operating range can also be expanded.

[0016]

[Embodiments of the Invention] Hereafter, the combustor by this invention is concretely explained based on the gestalt of operation shown in drawing 1 - drawing 4 . In addition, in the gestalt of the following operations, in order to simplify explanation, the same sign is given to the portion of the same composition as the conventional equipment shown in drawing 5 .

[0017] In drawing 1 , 13 is an extended pipe, was extended to the upstream of a fuel nozzle 3, and has surrounded the surroundings of it. Between the extended pipe 13 and the fuel nozzle 3, the acoustic-material electrode holder 16 (drawing 3) with perforated-plate 15 is installed in five layers in piles. It fills up with acoustic material 14 in the acoustic-material electrode holder 16.

[0018] The perforated plate 15 is installed for scattering prevention of acoustic material 14, and the acoustic-material electrode holder 16 is divided into several layers, because adjustment of a damping effect is enabled by the ability of the bias of acoustic material

14, and the thickness of acoustic material 14 to be set up freely. In addition, since the space which fills up the upper section of a fuel nozzle 3 with acoustic material 14 is provided, there is no fear of the flow of a combustion air being checked.

[0019] The acoustic material 14 with perforated-plate 15 is attached by the bolt 17, the nut 18, and the washer 19 also inside the vehicle room 2 (drawing 4).

[0020] With this acoustic material 14, as explained above, even if it is the conditions which combustion vibration oscillates by the burner which is not filled up with acoustic material 14 by attaching acoustic material 14 in the upstream of a fuel nozzle 3, or the vehicle room 2, since attenuation of burning space is increasing, combustion vibrational energy is absorbed and declines.

[0021] It becomes [in / the combustor of drawing 1 / as mentioned above] expandable / reduction of combustion vibration, and an operating range /. Of course, the kind of acoustic material 14 (glass wool, rock wool, etc.) and change of thickness are easy.

[0022] As mentioned above, although concretely explained based on the operation gestalt illustrating this invention, it cannot be overemphasized that various change may be added to the concrete structure and composition within the limits of this invention which this invention is not limited to these operation gestalten, but is shown in a claim.

[0023] For example, with the above-mentioned operation gestalt, although acoustic material 14 is attached to the ceiling section of the vehicle room 2, as long as even a space is in the vehicle room 2, the fitting location of acoustic material is not limited to this, but may be chosen suitably.

[0024]

[Effect of the Invention] It can be made to decrease, as this invention forms the pipe surrounding the upstream of a fuel nozzle, fill up the space between the pipe and fuel nozzle with acoustic material, or the combustor which prepared acoustic material in the inside of the structure which surrounds the surroundings of a combustor and forms

combustion-air passage is offered, combustion vibrational energy is effectively absorbed with acoustic material according to this as explained above, and shown in drawing 5 .

[0025] Moreover, the assembly becomes easy while preventing scattering of acoustic material by using the acoustic material constituted from much more acoustic material held with the perforated plate at least by this invention.